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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,348	09/30/2003	Atsushi Fukui	SNY-040	3442

20374 7590 10/19/2006

KUBOVCIK & KUBOVCIK  
SUITE 710  
900 17TH STREET NW  
WASHINGTON, DC 20006

EXAMINER

MARTIN, ANGELA J

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 10/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/673,348

Applicant(s)

FUKUI ET AL.

Examiner

Angela J. Martin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 and 9-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

This Office Action is responsive to the Amendment of August 7, 2006. The Applicant has canceled claim 8. However, the rejection is made final for the following reasons of record.

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-7, 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori, JP 2000-012088.

Rejection of claims 1-7, 9, 10 drawn to a negative electrode; claims 11-14 drawn to a method of making the negative electrode; claims 15 and 16 drawn to a lithium secondary battery.

Mori teaches a negative electrode for a lithium secondary battery prepared by forming an active material layer of silicon (sect. abstract) and a binder on a current collector comprising an electrically conductive metal foil (sect. 0005, 0007), and sintering the layer on the collector under a non-oxidizing atmosphere (sect. 0059), wherein the active material particles are primary particles having a mean diameter of 0.01-100 micrometers (sect. 0005), the particles are dispersed uniformly in the active material layer, the binder is a polyimide (sects. 0020 and 0031) and the particles and

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binder are uniformly mixed and distributed (sect. 0059). It teaches the active material is silicon (abstract). It teaches a surface roughness of the collector is 0.03 -1 micrometer (abstract). It teaches the current collector is a copper foil (sect. 0008). It teaches the current collector is an electrolytic copper foil (sect. 0008). It teaches an electrically conductive powder is mixed in the active material layer (sect. 0021). It teaches a binder (0031). It teaches the binder remains after sintering (sect. 0059). It teaches the binder remains after heat treatment (sect. 0059). It teaches a method for preparing a negative electrode for a lithium secondary battery comprising preparing a slurry comprising active material in a binder solution, wherein the active material is silicon having an average diameter of primary particles of 0.01-100 micrometers and coating the slurry on a current collector comprising metal foil to form active material layer, and sintering layer on collector under a non-oxidizing atmosphere (sect. 0059). It teaches the active material layer is press rolled together with the collector before sintering (sect. 0039). It teaches a lithium secondary battery comprising a negative electrode, a positive electrode, and a nonaqueous electrolyte (abstract).

Thus, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because although the mean diameter of the primary particles does not recite "a mean diameter of not greater than 1  $\mu\text{m}$ ," it does teach a mean diameter of 0.01-100  $\mu\text{m}$ , which overlaps the claimed range. It would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the size of the primary particles, since it has been held that where the

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general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

### ***Response to Arguments***

3. Applicant's arguments filed 8/7/06 have been fully considered but they are not persuasive. Applicant argues that Mori does not disclose sintering of the active material layer. However, "the patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Applicants have amended the claims to limit the binder to a polyimide (as originally recited in claim 8). However, based on the machine translation, the binder can be a polyimide as described in sections 0020 ("thermoplastics...imide system") and 0031 ("binder, the polymer...thermoplastics").

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Akagi et al., JP 11-339777, teach a secondary battery comprising a negative electrode, which includes silicon. Fukui et al., U.S. Pat. Application Pub. 2003/0235762 A1, teaches a negative electrode for a lithium secondary battery comprising a negative electrode, which includes silicon.

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5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela J. Martin whose telephone number is 571-272-1288. The examiner can normally be reached on Monday-Friday from 9:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AJM

  
PATRICK JOSEPH RYAN  
SUPERVISORY PATENT EXAMINER